

## **REMARKS**

### **I. Introduction**

Applicants and Applicants' attorney would like to thank Examiner Pham for his time and assistance during the interview conducted on July 10, 2003 to discuss the pending rejections. As explained in further detail below, Applicants have amended claim 1 in accordance with the Examiner's suggestion during the interview in order to clearly distinguish the present invention over the cited prior art reference. Applicants wish to thank the Examiner for his assistance in identifying distinguishing subject matter. In addition, as also discussed during the interview, Applicants submit new claims 39-50 for consideration. Claims 39-50 are believed to distinguish over the cited prior art for the reasons set forth below. No new matter has been added.

Finally, it is noted that the Applicants concurrently submit herewith an Information Disclose Statement for consideration by the Examiner.

### **II. The Rejection Of Claim 1 Under 35 U.S.C. § 102**

Claims 1, 4, 7, 12, 13, 37 and 38 were rejected under 35 U.S.C. § 102 as being anticipated by USP No. 5,652,165 to Lu. For the following reasons, Applicants respectfully submit that the pending claims are patentable over Lu.

Referring, for example, to Fig. 5 of the specification, claim 1 has been amended to further recite that a silicon nitride layer 18 is disposed between the supporting film 17 and the second insulating film 23x.

Turning to Lu and referring to Fig. 11 thereof, as asserted in the pending rejection, Lu discloses a support film 32A and a second insulating film 50 formed

directly on the support film 32A. As such, it is clear that Lu does not disclose a silicon nitride layer disposed between the supporting film and the second insulating film as is now recited by amended claim 1.

Accordingly, as anticipation under 35 U.S.C. § 102 requires that each element of the claim in issue be found, either expressly described or under principles of inherency, in a single prior art reference, *Kalman v. Kimberly-Clark Corp.*, 713 F.2d 760, 218 USPQ 781 (Fed. Cir. 1983), and Lu fails to disclose at least the foregoing element of the present invention, it is clear that Lu does not anticipate claim 1, or any claim dependent thereon.

For the foregoing reasons, it is respectfully submitted that claim 1, and all claims dependent thereon, are patentable over Lu.

### **III. The Rejection Of The Claims Under 35 U.S.C. § 103**

Claims 6 and 10 were rejected under 35 U.S.C. § 103 as being obvious over Lu in view of USP No. 5,936,272 to Lee. For the following reasons, Applicants respectfully submit that the pending claims are patentable over Lu and Lee taken alone or in combination with one another.

As set forth in the pending rejection, it is acknowledged that Lu fails to disclose a silicon nitride layer disposed between the supporting film and the second insulating film as recited by claim 1. It is asserted that Lu can be modified to include the third dielectric film 136 of Lee to arrive at the claimed invention.

However, Applicants respectfully submit that there is simply no motivation to make the proposed modification absent reference to the claimed invention, which is

impermissible.

Specifically, Lu discloses using silicon nitride as the best mode for the barrier layer 32A. Lee discloses using silicon nitride as the third dielectric layer 136. Thus, because the barrier layer 32A in Lu is the same as the third dielectric layer 136 in Lee, both composed of silicon nitride, there is no need for combination. Further, neither Lee nor Lu appear to provide any reason that would suggest to one of skill in the art that the proposed modification would provide a benefit. As such, there is no motivation to make the proposed modification.

Moreover, if Lu is modified by Lee in the manner set forth in the pending rejection, the manufacturing cost will increase due to the increase in manufacturing steps, which is the reverse of the object of Lu in reducing cost. Hence, there is no motivation to combine Lee and Lu.

It is well known that the fact that the prior art could be modified so as to result in the combination defined by the claims at bar would not have made the modification obvious unless the prior art suggests the desirability of the modification. *In re Deminski*, 796 F.2d 436, 230 USPQ 313 (Fed. Cir. 1986).

Moreover, recognizing after the fact that such a modification would provide an improvement or advantage, without suggestion thereof by the prior art, rather than dictating a conclusion of obviousness, is an indication of improper application of hindsight considerations. Simplicity and hindsight are not proper criteria for resolving obviousness. *In re Warner*, 379 F.2d 1011, 154, USPQ 173 (CCPA 1967).

For all of the foregoing reasons, it is respectfully submitted that claim 1, as amended, is patentable over Lu and Lee taken alone or in combination with one

another.

#### IV. New Claims 39-50

Referring to Fig. 5, new claim 39 of the present invention relates to a semiconductor device comprising: a substrate having a semiconductor region 1; an insulating film 16 formed on said semiconductor region 1 and having a property of reflowing due to a heat treatment under predetermined conditions; a silicon oxide film 17 formed on the insulating film 16; a silicon nitride film 18 formed on the silicon oxide film 17; a contact hole 19 formed through the silicon nitride film 18, the silicon oxide film 17 and the insulating film 16; and a contact formed in the contact hole 19, wherein the entire lower surface of the silicon oxide film 17 is in contact with the upper surface of the insulating film 16.

In contrast, as shown in Fig. 11 of Lu, the preferred structure disclosed by Lu is to form the barrier layer 32A comprising silicon nitride on the insulating layer 30A composed of TEOS oxide, BPSG or PSG. As such, Lu suggests utilizing the conventional structure, which corresponds to the prior art described in the background portion of the specification of the present invention.

According to Lee, as shown in Fig. 4G, the BPSG film 125 is formed such that the upper surface thereof is substantially in line with the upper surface of the gate line cap 72 formed on the gate electrode 70, and the O<sub>3</sub>-TEOS film 135 is formed over the BPSG film 125 and the gate line cap 72. Thus, only a part of the lower surface of the O<sub>3</sub>-TEOS film 135 is in contact with the BPSG film 125. In contrast, in the present invention, as shown in Fig. 5, the entire lower surface of the silicon oxide film 17 is in

contact with the insulating film 16.

Moreover, according to Lee, since the BPSG film 125 is formed on the gate line capping layer 117, the O<sub>3</sub>-TEOS film 135 is formed as an interlayer insulating film and therefore the object of Lee is different from that of the present invention.

For the foregoing reasons, it is respectfully submitted that claims 39-50 are patentable over Lu and Lee, taken alone or in combination with one another

**V. All Dependent Claims Are Allowable Because The Independent Claims From Which They Depend Are Allowable**

Under Federal Circuit guidelines, a dependent claim is nonobvious if the independent claim upon which it depends is allowable because all the limitations of the independent claim are contained in the dependent claims, *Hartness International Inc. v. Simplimatic Engineering Co.*, 819 F.2d at 1100, 1108 (Fed. Cir. 1987).

Accordingly, as claims 1 and 39 are patentable for the reasons set forth above, it is respectfully submitted that all pending dependent claims are also in condition for allowance.

**VI. Request For Notice Of Allowance**

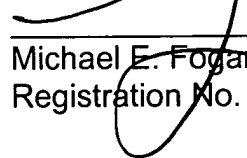
Having fully responded to all matters raised in the Office Action, Applicants submit that all claims are in condition for allowance, an indication for which is respectfully solicited.

If there are any outstanding issues that might be resolved by an interview or an Examiner's amendment, the Examiner is requested to call Applicants' attorney at the telephone number shown below.

Respectfully submitted,

McDERMOTT, WILL & EMERY

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